REMARKS

Allowable Subject Matter

Applicants gratefully acknowledge that the Examiner has again indicated that claim 39 is allowed, and that claims 12, 13, 29, and 30 recite allowable subject matter.

Amendments

Claim 15 is amended to recite that the polymer precursor is a polyimide polymer or a precursor of a polyimide polymer. New claims 42-48 are similar to claims 2, 12, 13, 25, 26, 29, and 30, except that they depend from polymer precursor claim 15.

Rejection under 35 USC 102(b) in view of Ito et al.

Claims 1, 3-5, 8, 17-21, 27, 28, 31, 33-35, and 38 are rejected as being anticipated in view of Ito et al. (US 2002/014691). This rejection is respectfully traversed.

As describe in paragraph [0019] of the published application, Ito et al. disclose an optical compensatory sheet that comprises a transparent support and an optically anisotropic layer. The optically anisotropic layer is formed from liquid crystal molecules and monomers having four or more double bonds. These monomers are polymerized to form a cross-linked polymer in the optically anisotropic layer. The optical compensatory sheet can further comprise an orientation layer between the transparent support and the optically anisotropic layer. See, for example, claim 7.

In the rejection, reference is made to paragraph [0196] which relates to the orientation layer. As stated in paragraph [0196], the orientation layer provides the function of aligning the liquid crystal molecules. In addition, the polymer for the orientation layer preferably has side chains with cross-linkable functional groups (e.g., double bonds). As described in paragraph [0201], these cross-linkable groups provide for bonding to occur between the polymer of the orientation layer and the multifunctional monomers of the optically anisotropic layer. This results in enhancement of the mechanical strength of the optical compensatory sheet.

The rejection also refers to paragraph [0298] which relates to the formation of the optically anisotropic layer. To form the optically anisotropic layer, a coating solution

containing discotic liquid crystals is applied to the orientation layer. The molecules of the optically anisotropic layer are aligned, and then polymerized.

In the rejection, it is alleged that during the preparation of the optically anisotropic layer "at least one of the reactive mesogens in monomeric form is expected to infiltrate the polymer layer … and thus be present within the polymer film of the alignment layer after preparation of said alignment layer." However, this is mere speculation. Ito et al. make no mention or any suggestion whatsoever about the occurrence of such an infiltration.

The rejection presents no rationale as to why one of ordinary skill in the art would expect such an infiltration. Furthermore, the rejection fails to present any rationale as to why such an infiltration will necessarily occur, which would be required to establish inherency in an anticipation rejection. See, for example, *Trintec Industries, Inc. v. Top-U.S.A. Corp.*, 295 F.3d 1292,___, 63 USPQ2d 1597, 1599 (Fed. Cir. 2002) ["Inherent anticipation requires that the missing descriptive material is 'necessarily present,' not merely probably or possibly present, in the prior art."]

The alignment layer used in the embodiment described in paragraph [0298] is a polyvinyl alcohol layer. See paragraph [0296]. Polyvinyl alcohol has a high polarity, and thus is soluble in only solvents like water, methanol, and ethanol. See, for example, paragraph [0296] wherein the solvent used for the coating solution for formation of the alignment layer is a mixture of water and methanol. But, polyvinyl alcohol is not soluble in other organic solvents, such as methyl ethyl ketone, i.e., the solvent used in the coating solution for formation of the optically anisotropic layer in paragraph [0298].

See also the attached documents which also describe the solubility of polyvinyl alcohol: (1) S. K. Saxena, "POLYVINYL ALCOHOL (PVA): Chemical and Technical Assessment, (2004); (2) "Material Safety Data Sheet, Polyvinyl alcohol MSDS," Science Lab.com, Chemical & Laboratory Equipment; and (3) D. L. Hamilton, "Methods of Conserving Archaeological Material from Underwater Sites," Texas A&M University (1999).

Thus, since the solvent used in the coating solution in paragraph [0298] is made from methyl ethyl ketone, there is no expectation that this solvent will dissolve part of the PVA alignment layer to permit the alleged infiltration described in the rejection. Therefore, the rejection fails to establish the underlying premise that such infiltration will necessarily occur.

In view of the above remarks, it is respectfully submitted that the disclosure of Ito et

al. fails to describe, either expressly or inherently, all of the features of applicants' claimed invention. Thus, the disclosure of Ito et al. fails to establish anticipation of applicants' claimed invention under 35 USC 102(b). Withdrawal of the rejection is respectfully requested.

Rejection under 35 USC 103(a) in view of Ito et al.

Claims 2, 14, 22-24, 32, and 41 are rejected as being obvious in view of Ito et al. (US 2002/014691). See pages 8-9 and 14-15 of the Office Action. These rejections are respectfully traversed.

As with the previos anticipation rejection, the rejection of claims 2, 14, 22-24, and 32 under 35 USC 103(a) in view of Ito et al. also is based on the premise that reactive mesogens of the optically anisotropic layer will be expected to infiltrate the polymer alignment layer. As discussed above, there is no basis for such an expectation since the PVA alignment layer is not soluble in the solvent of the coating solution used to form the optically anisotropic layer.

In view of the above remarks, it is respectfully submitted that the disclosure of Ito et al. fails to render obvious applicants' claimed invention under 35 USC 103(a). Withdrawal of the rejection is respectfully requested.

Rejection under 35 USC 103(a) in view of Ito et al. and Tsuboyama et al.

Claim 7 is rejected as being obvious in view of Ito et al. (US 2002/014691) in combination with Tsuboyama et al. (US 5,099,344).

The disclosure of Ito et al. is discussed above. In the rejection, it is acknowledged that Ito et al. fail to disclose an alignment layer which comprises a polyimide film. In the rejection, it is argued that Tsuboyama et al. disclose a polyimide alignment layer. See column 4, lines 8-18.

However, the disclosure of Tsuboyama et al. does not overcome the deficiencies in the disclosure of Ito et al., as discussed above. Tsuboyama et al. provide no suggestion of the presence of reactive mesogenic additives in the alignment layer.

In view of the above remarks, it is respectfully submitted that the disclosure of Ito et al., taken alone or in combination with the disclosure of Tsuboyama et al, fails to render

obvious applicants' claimed invention. Withdrawal of the rejection is respectfully requested.

Rejection under 35 USC 103(a) in view of Ito et al. and Takiguchi et al.

Claim 9 is rejected as being obvious in view of Ito et al. (US 2002/014691) and Takiguchi et al. (US 4,984,873).

The disclosure of Ito et al. is discussed above. In the rejection, it is acknowledged that Ito et al. fail to disclose an alignment layer which comprises triacetate cellulose (TAC). In the rejection, it is argued that Takiguchi et al. disclose a triacetate cellulose alignment layer. See column 12, lines 1-25.

However, the disclosure of Takiguchi et al. does not overcome the deficiencies in the disclosure of Ito et al., as discussed above. Takiguchi et al. provide no suggestion of the presence of reactive mesogenic additives in the alignment layer.

In view of the above remarks, it is respectfully submitted that the disclosure of Ito et al., taken alone or in combination with the disclosure of Takiguchi et al., fails to render obvious applicants' claimed invention. Withdrawal of the rejection is respectfully requested.

Rejection under 35 USC 103(a) in view of Ito et al. and Ichimura et al.

Claims 10-11 are rejected as being obvious in view of Ito et al. (US 2002/014691) and Ichimura et al. (US 6,001,277).

The disclosure of Ito et al. is discussed above. In the rejection it is acknowledged that Ito et al. do not disclose a command layer comprising an isomerizable azobenzene compound.

Ichimura et al. disclose a liquid-crystal display device that comprises a pair of substrates, each of which is provided with a liquid-crystal alignment film, at least one the substrates having an electrode, and a liquid crystal held between the substrates. The liquid-crystal alignment films comprise a resin that contains photoisomerizable and dichroic structural units, such as units of azobenzene derivatives and stilbene derivatives. See column 4, lines 7-47. As described at column 9, lines 31-44, the photoisomerizable and dichroic structural units may be mixed with the resin and can be chemically bonded to each other or to the resin by at least one of irradiation with light and heating.

However, the disclosure of Ichimura et al. does not overcome the deficiencies in the disclosure of Ito et al., as discussed above. Ichimura et al. do not disclose or suggest an

alignment layer that comprises a polymer film containing at least one reactive mesogen additive, wherein the additive has unreacted polymerizable groups after preparation of the alignment layer.

In view of the above remarks, it is respectfully submitted that the disclosure of Ito et al., taken alone or in combination with the disclosure of Ichimura et al, fails to render obvious applicants' claimed invention. Withdrawal of the rejection is respectfully requested.

Rejection under 35 USC 103(a) in view of Ito et al. and Komatsu et al.

Claims 25, 26, 36, and 37 are rejected as being obvious in view of Ito et al. (US 2002/014691) in combination with Komatsu et al. (US 5,989,758).

The disclosure of Ito et al. is discussed above. It is acknowledged in the rejection that Ito et al. fail to disclose the birefringence of the alignment layer. However, it is argued that Komatsu et al. disclose an orientation substrate which is "optically isotropic." See column 24, lines 14-19. In the rejection, it is further asserted that "optically isotropic" means a birefringence of zero.

Komatsu et al. do not define what is meant by "optically isotropic." One of ordinary skill in the art reading the disclosure of Komatsu et al. does not know whether "optically isotropic" in the context of the disclosure means a birefringence of less than 1, less than 0.1, or zero, or some other value. Nothing within the disclosure of Komatsu et al. or within the rejection supports the conclusion that "optically isotropic," in the context of the Komatsu et al. disclosure, definitively means a birefringence of zero.

Moreover, the disclosure of Komatsu et al. does not overcome the deficiencies in the disclosure of Ito et al. as discussed above. Komatsu et al. provide no suggestion of the presence of reactive mesogenic additives in the alignment layer.

In view of the above remarks, it is respectfully submitted that the disclosure of Ito et al., taken alone or in combination with the disclosure of Komatsu et al., fails to render obvious applicants' claimed invention. Withdrawal of the rejection is respectfully requested.

Rejection under 35 USC 103(a) in view of Ito et al. and Lacker et al.

Claim 40 is rejected as being obvious in view of Ito et al. (US 2002/014691) in view of Lacker et al. (US 4,944,576).

The disclosure of Ito et al. is discussed above. It is asserted in the rejection that Ito et al. inherently disclose the presence of at least one reactive mesogen additive in the polymer of the alignment layer after polymerization thereof. Further, it is argued that Lacker et al. disclose that such a mesogen compound will inherently function as a plasticizer, based on the disclosure at column 5, lines 40-45.

The disclosure of Lacker et al. is directed to the formation of polymer dispersed liquid crystal films (PDLC films). These are defined as films that consist of "droplets or bubbles of liquid crystal molecules (LC) dispersed in a clear or light transmitting, flexible plastic sheet or film." See column 1, lines 19-22. Lacker et al. disclose that their PDLC film is prepared by first forming dissolving liquid crystal material in a polymerizable monomer system. The resultant solution is then polymerized to form a film having a dispersion of liquid crystal bubbles therein. During polymerization, the liquid crystal molecules within the bubbles are partially aligned by application of an electric or magnetic field or by mechanical flow. See column 2, lines 57-66, and column 5, lines 36-42

At column 5, lines 42-46, Lacker et al. do disclose that, while most of the liquid crystal molecules are dispersed in the film in the bubbles, a fraction of the LC molecules are "retained in the polymer as isotropic plasticizers or as microdroplets."

It is clear that Lacker et al. do not disclose the addition of reactive mesogenic additives **after polymerization.** For the PDLC film to contain the desired LC bubbles, the liquid crystal compounds are added before polymerization. Thus, Lacker et al. fail to disclose the addition of least one reactive mesogen additive to a polymer film after polymerization thereof.

Additionally, the polymer film of Lacker et al. is a PDLC film, not an alignment layer. Thus, Lacker et al. provides no rationale for modifying the alignment layer of Ito et al.

Furthermore, the disclosure of Lacker et al. does not overcome the deficiencies in the disclosure of Ito et al. as discussed above. Lacker et al. provide no suggestion of the presence of reactive mesogenic additives in the alignment layer.

In view of the above remarks, it is respectfully submitted that the disclosure of Ito et al., taken alone or in combination with the disclosure of Lacker et al., fails to render obvious applicants' claimed invention. Withdrawal of the rejection is respectfully requested.

Rejection of Claim 15 under 35 USC 102(b) in view of Coates et al.

Claim 15 is rejected as being anticipated in view of Coates et al. (US 6,042,745). This rejection is respectfully traversed.

In the rejection it is asserted that Coates et al. disclose a polymer precursor comprising a reactive mesogen and a polymer or a precursor of the polymer. Specifically, the rejection refers to the disclosure by Coates et al. at column 7 which relates to the procurer of a PDLC film.

However, Coates et al. do not disclose a polymer precursor for preparing an alignment layer that comprises at least one reactive mesogen additive and a polyimide polymer or a precursor of a polyimide polymer. Compare applicants' amended claim 15.

In view of the above remarks, it is respectfully submitted that the disclosure of Coates et al. fails to establish anticipation of applicants' claimed invention under 35 USC 102(b). Withdrawal of the rejection is respectfully requested.

The Commissioner is hereby authorized to charge any fees associated with this response or credit any overpayment to Deposit Account No. 13-3402.

Respectfully submitted,

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Date: October 22, 2010